SEPARATION OF SOME *ERISTALIS* SPECIES USING ABDOMINAL COLOUR PATTERN

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Some sets of hoverfly species are rather difficult or laborious to separate in the field (e.g. *Baccha* spp., *Paragus* spp., *Sphaerophoria* spp.) and collectors often decide to capture a few to identify them later on with the aid of a microscope. When all species concerned are interesting for one reason or another this poses no real problem, but occasionally a rare or scarce hoverfly resembles a particularly abundant species. In this situation many records of the less common species may be completely overlooked and, consequently, an accurate picture of their distribution and abundance may take a very long time to emerge. Any studies on long-term population changes in a species such as this would have little value given the unreliability of past distribution and abundance estimates.

Stubbs and Falk (1983) describe *Eristalis abusivus* Collin as a "local" species but "the commonest *Eristalis* in some coastal districts". The separation of *E. abusivus* from the closely related *E. arbustorum* (L.) is relatively straightforward, but requires inspection of the fine structure of the arista. Other characters that can be used include the distance over which the eyes touch in the males (van der Goot, 1981) and the amount of yellow on the tibia of the middle leg. Apart from perhaps the eye character in the males, none of them are very accessible to use in the field. However, the biggest problem is that similar species, such as *E. arbustorum* and *E. nemorum* (L.), are so abundant and widespread. In a mass of *Eristalis* species, not many entomologists would be prepared to devote time to checking hundreds of individuals on the chance that a few *E. abusivus* are present. Stubbs and Falk (1983) also consider it likely that this species is overlooked in the field.

Recently, I carried out a study of colour variation in certain *Eristalis* species using museum specimens held at the Natuurhistorische Museum in Leiden, The Netherlands (Holloway, 1993). The sample sizes were large and for *E. arbustorum*, *E. abusivus* and *E. nemorum* 3169, 843 and 826 individuals were inspected, respectively. Using these specimens, I was able to ascertain not only the amount of pattern variation shown, but also any consistent pattern differences among the species (Figure 1). Although this type of quantitative variation is not generally considered useful to identify species, I found, in the course of my study, that I was able to identify many individuals immediately solely on the basis of their colour pattern. A couple of *E. arbustorum* that had somehow crept into the *E. abusivus* boxes stuck out like sore thumbs! It occurred to me that colour pattern differences may be a quick and easy way of provisionally assessing in the field the occurrence of *E. abusivus*. Having captured a likely looking candidate, the accepted qualitative characters could then be used to confirm identification.

There was always a considerable difference between the sexes in all species with most of the variation in females occurring on tergite 2 and in males on tergite 3. There were a number of important consistent differences between the colour patterns of *E. arbustorum* and *E. abusivus*. In *E. abusivus*, the yellow patches on the abdomen never touched the trailing edge of tergite 2 in females and tergite 3 in males. In *E. arbustorum*, the trailing edges of these tergites were often reached by the yellow patches. In female *E. abusivus*, the yellow patches on tergite 2 when present assumed a hooked shape, whilst in female *E. arbustorum* the yellow patches were more

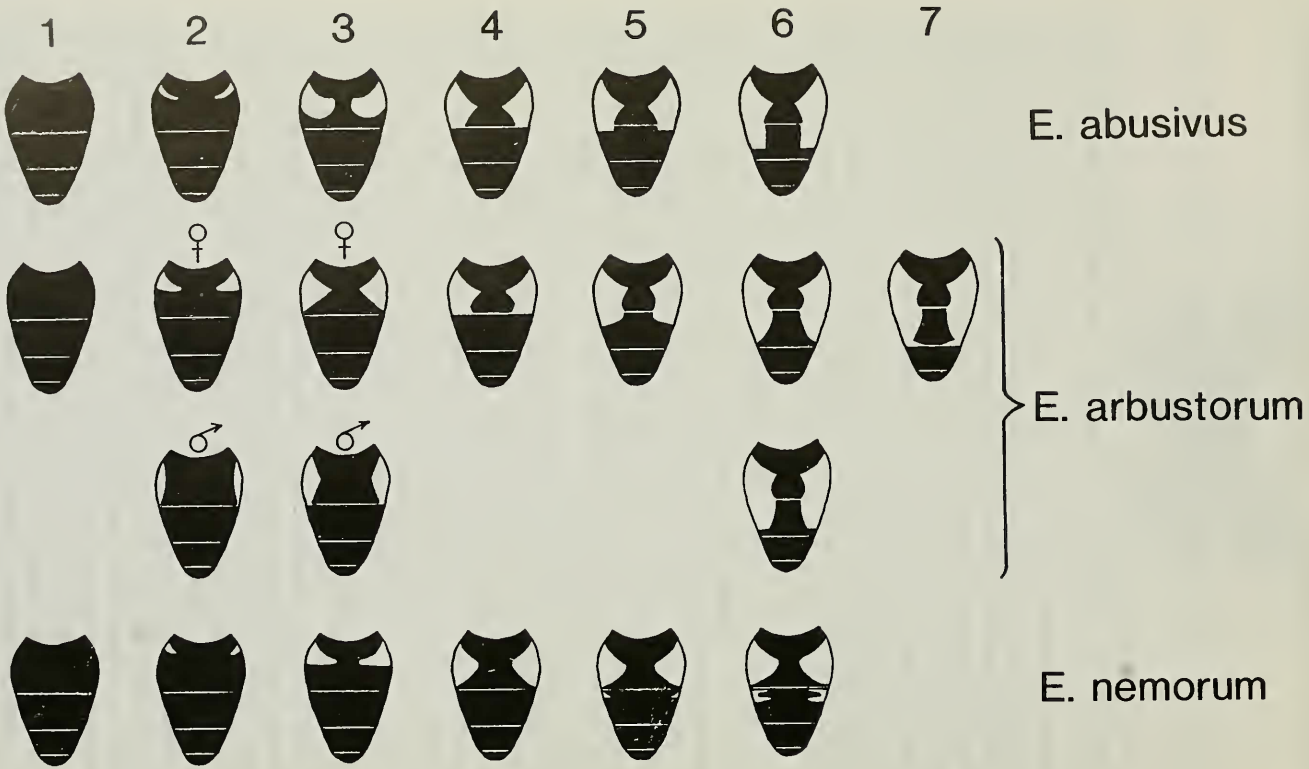

Fig. 1. Scheme used to classify extent of yellowish markings on abdominal tergites in three species of *Eristalis* hoverflies. Range of patterns in *E. arbustorum* placed into category 6 is shown. Categories 2 and 3 differed between the sexes in *E. arbustorum* as indicated.

triangular. In male *E. abusivus*, the yellow patches on tergite 3 were squarish with the vertical inner edge and the bottom edge of the yellow patch forming a 90° angle. In male *E. arbustorum* the inner edge of the yellow patch on tergite 3, more often than not, curved outwards towards the lateral margins of the tergite. Of course, colour pattern could not always be used. For example, the females of both species are sometimes devoid of all paler pigmentation on the abdomen. However, over 60% of female *E. arbustorum* were assigned to the categories 3 and 4 shown in Figure 1 and over 30% of female *E. abusivus* were category 3. All of these insects could be instantly identified without reference to further characters. As for the males, over 85% of *E. abusivus* were of category 6 and over 60% of *E. arbustorum* fell into category 6 or 7. Again, all of these individuals were easy to identify. Clear differences also existed between *E. nemorum* and the other two species, as can be seen from Figure 1, which again facilitate separation of *E. abusivus* from *E. nemorum*.

This study was carried out using insects that were collected in The Netherlands. It is likely, although yet to be established, that the range and type of colour variation shown by *E. abusivus* in Britain is the same as found in The Netherlands. If this indeed proves to be the case, then colour pattern differences could be a useful way of screening large numbers of *Eristalis* species quickly and efficiently.

Acknowledgement

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References

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ANNOUNCEMENT

Librarian needed.—I am leaving this position after the 1995 annual general meeting, having performed this function since 1982. Therefore a replacement person is sought for this post as soon as possible. The main duties are to monitor the members' use of the library using computer methods, purchase new material, monitor existing exchanges of journals and arrange new exchanges with other entomological organizations and manage the organization and shelving of the stock.

The new facilities at Dinton Pastures, combined with the installation of a new computer to use with the society's existing library database make the job of library management somewhat easier than it used to be at our old rooms in South Audley Street. However attendance is required at the new rooms once a month, as a minimum, to open the post, record and shelve incoming items and monitor loans.

Due to ever-increasing work commitments and other considerations I feel I can no longer give as much time to the position as it requires. A full description of the duties of the post are available from me, Stephen Miles, Librarian, 469 Staines Road West, Ashford, Middlesex TW15 2AB, tel: 0784 252274.